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NPRDC TR 74-34

MAY 1974

**DESCRIPTION OF AN "IDEAL" CHANGE
ADVOCATE IN A TECHNICAL NAVY SETTING**

**Alvin J. Abrams
John P. Sheposh
Mark H. Licht**

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DESCRIPTION OF AN "IDEAL" CHANGE ADVOCATE
IN A TECHNICAL NAVY SETTING

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Sponsored by

Psychological Sciences Division
Office of Naval Research
Contract Authority Identification Number NR 170-762

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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE

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1. REPORT NUMBER TR 74-34		2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) DESCRIPTION OF AN "IDEAL" CHANGE ADVOCATE IN A TECHNICAL NAVY SETTING		5. TYPE OF REPORT & PERIOD COVERED Technical Report	
		6. PERFORMING ORG. REPORT NUMBER	
7. AUTHOR(s) Alvin J. Abrams John P. Sheposh Mark H. Licht		8. CONTRACT OR GRANT NUMBER(s)	
9. PERFORMING ORGANIZATION NAME AND ADDRESS Navy Personnel Research and Development Center San Diego, California 92152		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS NR 170-762 61153N	
11. CONTROLLING OFFICE NAME AND ADDRESS Organizational Effectiveness Research Programs Office of Naval Research (Code 452) Arlington, Virginia 22217		12. REPORT DATE May 1974	
		13. NUMBER OF PAGES 50	
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)		15. SECURITY CLASS. (of this report) UNCLASSIFIED	
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE	
16. DISTRIBUTION STATEMENT (of this Report) Approved for Public Release; Distribution Unlimited			
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)			
18. SUPPLEMENTARY NOTES			
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Change Advocate Change Agent Organizational Change Innovation			
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This report describes the first phase of a larger effort. The purposes of this study were to identify: (1) whether fleet technical personnel could accept the Change Advocate concept within their team, (2) what characteristics are deemed important for a Change Advocate in the shipboard setting, (3) whether some technical personnel presently aboard ships possess the characteristics deemed essential for the Change Advocate, and (4) whether responses from technical personnel are generalizable across platforms.			

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Eighty-three technicians and nine division officers from four submarines, three destroyers, and three repair shops of two submarine tenders served as subjects. They each responded to a questionnaire which required nominations for a Change Advocate within their team, ratings of their nominees and ratings of the importance of 25 traits, and responses to a set of sociometric items.

Results revealed that: (1) most technicians evaluated the Change Advocate role to be very important, (2) most technicians who might be qualified for the role, desired the role, (3) technicians who were nominated by team members to be the Change Advocate were described as competent and motivated, (4) effectiveness and competency as a technician, skillfulness in communications, and flexibility were the major requisites of the "ideal" Change Advocate, and (5) overall, responses by technicians were not platform specific.

FOREWORD

This research was performed under ONR sponsorship, NR 170-762. The research is part of a larger effort in which a model for enhancing change will be applied to the introduction of a major new submarine sonar system.

The assistance of Commander, Cruiser-Destroyer Force, Pacific Fleet, Commander, Submarine Group FIVE, and Commander, Submarine Squadron THREE is appreciated. Specifically, the cooperation and participation of the personnel aboard the following ships are acknowledged:

USS DIXON (AS-37)
USS SPERRY (AS-12)
USS BRONSTEIN (DE-1037)
USS BREWTON (DE-1086)
USS ROBISON (DDG-12)
USS PERMIT (SSN-594)
USS SNOOK (SSN-592)
USS PINTADO (SSN-672)
USS SCAMP (SSN-588)

F. L. Nelson
Commanding Officer

SUMMARY

Problem

Misutilization or nonutilization of major new systems has been a recurrent problem in the Navy. Civilian parallels in industry and education can be noted, and the use of a Change Advocate has proven beneficial in some civilian settings. The definition of a Navy Change Advocate within a technician team is the basic problem addressed by this research.

Research Objectives

The objectives of this research were to assess the acceptability of the Change Advocate role to Navy technician teams, to determine what traits would be preferred in a Change Advocate representing a technician team, to evaluate the degree to which technician teams have members who might fill the Change Advocate role, and finally to determine whether the role definition of the Change Advocate is platform specific (e.g., submarine, destroyer, submarine tender).

Approach

Eighty-three technicians and nine division officers from ten technician teams aboard four submarines, three destroyers, and two submarine tenders served as subjects. They each responded to a questionnaire which included nominations for a Change Advocate within their teams, ratings of their nominees on 25 traits and ratings of the importance of these 25 traits to the Change Advocate role, and a set of sociometric items.

Results

Most technicians considered the Change Advocate role to be an important one which is applicable to the Navy technician team setting, and most technicians who might be qualified for the role expressed a desire to perform in that role. Competency and job motivation were the most frequently ascribed characteristics of men who were nominated to serve as Change Advocate; and effectiveness and competency as a technician, skillfulness in communication and flexibility were the major requisites of the "ideal" Change Advocate. Finally, responses by technicians indicate that the Change Advocate role is generalizable to technician teams on various Navy platforms.

Recommendations

This study is the first phase of a broader research program in which a Change Advocate will be experimentally tried out in an operational setting. While the results of this study are not interpreted to indicate any recommendations for the operational Navy, the results do substantiate the recommendation that the present research effort should continue.

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DESCRIPTION OF AN "IDEAL" CHANGE ADVOCATE IN A TECHNICAL NAVY SETTING

I. Introduction

A. Background

The research described in this report is part of a larger effort in which a Change Advocate role and a model for implementation of change will be evaluated in the introduction of a major new computerized shipboard system. The desire to undertake this larger effort was based upon the recognition that typically major new systems are only partially used, misused, or, with respect to some functions, not used for years after their introduction to the fleet. A case in point is the AN/SQS-26 Sonar System which was introduced to the fleet during the early 1960s. Documentation of continuing widespread misuse was obtained nearly ten years later (Stern, 1971). Other examples can be found in the literature (Mathews, Whittenburg, Barnes, Cheek, & Wise, 1965; Mecherikoff & Mackie, 1970).

Recognizing that nonacceptance of innovation occurs in civilian as well as in the military sphere, various sources (Bowers, 1973; Elizur, 1970; Havelock, 1973; Jones, 1969) were reviewed to determine what solutions to the problem have been proposed or attempted. Researchers of various theoretical orientations indicate the value of a Change Advocate in facilitating the acceptance of change. The concept of a Change Advocate seemed applicable to the Navy setting; consequently, it was decided to modify the role to fit the shipboard environment and train shipboard technicians to fulfill this role. This report describes the first phase of the overall program. The purposes of this study were to identify: (1) whether fleet technical personnel could accept the Change Advocate concept within their team, (2) what characteristics are deemed important for a Change Advocate in the shipboard setting, (3) whether some technical personnel presently aboard ships possess the characteristics deemed essential for the Change Advocate, and (4) whether responses from technical personnel would be platform specific (i.e., submarine, destroyer, submarine tender), and thus negate the possibility of a generalizable Change Advocate concept within the Navy.

B. A Proposed Change Advocate Role in the Navy Setting

The Change Advocate is generally defined as a person who directly interacts with the user, or client, as a representative of the Change Agent. The Change Agent is then defined as an individual or agency sponsoring a change (Mecherikoff & Mackie, 1970). Mecherikoff and Mackie (1970) further indicate that the Change Advocate should be selected from the user population whenever possible.

Mackie et al, (1972) stress the importance of the Change Advocate in determining attitudes toward new equipment and other innovations.

They link the failure to utilize many new equipments properly to the unfilled role of Change Advocate during the introduction of the equipment. The Change Advocate is described as, "some individual who functions, formally or informally, in the role of initial communicator concerning the advantages and capabilities of the device to the potential users [p. 3]." Mackie et al also indicate the necessity of choosing a Change Advocate with proper qualifications and characteristics, "particularly if the innovation is in the area where the potential users consider themselves experts [p. 3]." Factors are identified that affect the success of the Change Advocate. These factors include: "The Change Advocate's credibility, prestige, perceived motivation, relationship to users, apparent impartiality, intent to influence, and methods of handling criticism . . . [p. 3]."

Jones (1969) discusses the role of the Change Catalyst in planned organizational change. The Change Catalyst in his system is roughly analogous to the Change Advocate. The Change Catalyst is defined as, "any agent that causes, speeds up, or slows down change in an organizational system [p. 16]." Jones stresses the facilitator aspect of the role of the catalyst. This individual should offer, "acceptable and constructive suggestions which are considered to be based upon wisdom and experience [p. 48]." In addition, the Change Catalyst is perceived to be endogenous to the client system. He is therefore well acquainted with the nuances and dynamics of the client system. In other words, the Change Catalyst is usually an insider. The Change Catalyst as described by Jones (1969) may play an important role throughout the change process; however, he is most necessary during the initiation of change. In every case study reviewed by Jones, "the Change Catalyst assumed the predominant role in the initiation phases of the change . . . [p. 52]."

Given the introduction of a new system in the Navy, the Naval Ships System Command and/or a Research and Development Center (e.g., Naval Undersea Center (NUC), Naval Underwater Systems Center (NUSC), Naval Electronics Laboratory Center (NELC)) might be identified as the Change Agent, and fleet Navy personnel as the primary user population. Mecherikoff and Mackie (1970) recommend that an experienced technician from the rating to be affected by an innovation be selected to represent the Change Agent in interacting with his peer group. Since this Change Advocate would "represent" the Change Agent, it is assumed that he would have to be assigned to the Bureau or R&D Center and visit various ships to interact with the user group.

While the Change Advocate as defined in the preceding paragraph has not been tried out or evaluated, it is suggested that such a Change Advocate might still be identified by the user group as representing the interests of the Change Agent more than the user group. Additionally, his presence during visits might not correspond to critical periods in which change advocacy might be urgent. It was therefore decided to consider a person within each user team (e.g., submarine sonar team, destroyer ET team) for the Change Advocate role. This Change Advocate

would represent the user group and accept the challenge of facilitating a fair and thorough try-out of a new system within his group.

The proposed Change Advocate role is not that of a super salesman for the new system. On the contrary. He should lead his team in rejecting the innovation in the rare case in which a fair and thorough evaluation proves the new system to be inadequate. With respect to the typical innovation, it is assumed that some of the shipboard responsibilities of the Change Advocate will be to: (1) be aware of various sources of information and lead his peer group in obtaining and using such information, (2) initiate, through accepted Navy channels, the requirement for additional information when operational experience reveals the necessity for such information, (3) be aware of the demands for new skills and knowledges in operating and maintaining the new system and through example and by conventional instructional techniques lead his team in acquiring these skills and knowledges, (4) be aware of problems which often occur during the implementation of an innovation and be prepared to cope with these problems, and (5) be thoroughly informed of the capabilities and functions of the new system and assure that the equipment is tried out fairly and thoroughly with respect to its capabilities and functions.

II. Procedures

A. Construction of the Questionnaire

The questionnaire which was used in this study is included as Appendix A. In designing the study and in constructing this instrument, it was considered essential that the respondent conceive of the situation as being quite real and not vague or hypothetical. Hence, the questionnaire first informed the respondent that the Navy was considering the possible use of a System Specialist. (The term System Specialist was used instead of Change Advocate because it was the consensus of a number of naval officers and enlisted men that this label would be more palatable in the Navy setting than Change Advocate.) The respondent was told that the task of the System Specialist was to facilitate the introduction of new equipment by being aware of and by dealing with problems which frequently arise with the introduction of new systems. Specifically, the System Specialist would receive and/or monitor documentation regarding new equipment, represent the needs of the crew to those involved in equipment development and attempt to acquaint the crew with the new system in an honest and constructive way. An attempt was made to provide sufficient detail for the respondent to conceptualize the role, but to avoid providing a level of detail which would strongly clue or dictate the respondents' specific responses to later questionnaire items.

Following the introduction of the System Specialist role, the respondent's attention was directed to a new system. In some cases, this was a new system which his ship had very recently received. In other cases it was a new system which his ship was in the process of

receiving, and finally, in some situations, it was a new system which his ship might receive in the future.

With the System Specialist role described and a specific technological innovation in mind, it was considered likely that responses would be anchored to a relatively real situation. The remainder of the questionnaire can be viewed as having four parts.

The respondent was first asked to nominate from his technician team his first choice and an alternate for the System Specialist role and to indicate three reasons for each nomination. The nomination of a System Specialist was intended to provide a more explicit reference for later responses to structured items. The request for the respondent's reasons for his selection preceded the structured questions so that the reasons given would not be influenced by the structured questions.

The second section of the questionnaire consisted of a set of 25 trait-type statements (e.g., gets along well with lower ranking personnel, is an outstanding leader, takes pride in his rate). Respondents were asked to rate their first choice for System Specialist on a 15-point scale relative to each item, and then to rate on a 5-point scale, the importance of this trait to the System Specialist role. The two sets of ratings were included to enable a comparison between the on-board System Specialist and the "ideal" System Specialist.

The third section consisted of four questions which were designed to assess the acceptability of the System Specialist. Using a 15-point scale, respondents rated whether the System Specialist was a good idea and whether that role would serve an important function. Respondents then indicated whether they thought that their first choice would accept the role and whether they personally would like the role.

The final section consisted of a set of five sociometric items and one item in which respondents listed any team members that they really didn't know. This section was included to enable a cross check of the information which was obtained from the open ended descriptions of reasons for selecting System Specialists and the structured items. The sociometric items were selected from a set of items used in Operation Deepfreeze (Seymour, 1971) and modified slightly to be appropriately worded for the technical team setting.

B. Subjects

Subjects were 83 technicians and nine division officers from four submarines, three destroyers and three repair ships of two submarine tenders. To the maximum degree possible complete teams (e.g., ST team, ET team) were used; however, in virtually all cases one, but never more than three, team members were not present and could not be reached in later follow-up efforts. Table 1 shows the number of technicians by platform, rate, and rate level. It is apparent that: (1) The sample was quite evenly divided among the three platforms,

TABLE 1

Number of Enlisted Technicians and Officers Sampled
by Platform, Rating, Rank, and Rate Level

Rank/Rate Level	Submarine		Destroyer		Submarine Tender					Total	
	ST	Division Officer	ST	OT	Division Officer	EM	ST	ET	OM		Division Officer
LT	-	-	-	-	1	-	-	-	-	-	1
LTJG	-	1	-	-	1	-	-	-	-	-	2
ENS	-	1	-	-	-	-	-	-	-	-	1
Warrant Officer	-	1	-	-	1	-	-	-	-	3	5
E-9	-	-	-	-	-	1	-	-	1	-	2
E-8	-	-	-	-	-	-	-	-	-	-	0
E-7	4	-	2	1	-	-	-	-	1	-	8
E-6	1	-	2	1	-	2	-	3	3	-	12
E-5	10	-	9	2	-	-	1	2	2	-	26
E-4	11	-	7	3	-	6	1	3	2	-	33
E-3	-	-	2	-	-	-	-	-	-	-	2
TOTAL	26	3	22	7	3	9	2	8	9	3	92

(2) five ratings were represented, (3) virtually all of the enlisted men were rated, (4) although there were some apparent minor differences in the rate levels of enlisted men across platforms (e.g., both E-9s were from submarine tenders, both strikers were from destroyers) most subjects from each platform were at the E-4 and E-5 level, and (5) division officers from submarine tenders were Warrant Officers while aboard destroyers and submarines they were more frequently junior commissioned officers.

Table 2 presents a distribution of the self reports of how long each member of the sample had been a member of the particular technician team on his ship. These data are pertinent to the question of whether the respondents had worked together long enough to provide valid responses to the questionnaire items, and overall it is quite obvious that most men had been a team member long enough to know most of their fellow team members. Confirmatory evidence was obtained from an item on the questionnaire in which respondents listed those team members whom they felt they did not know. Approximately five percent of the respondents indicated that they did not know most of the crew.

The data in Table 2 also reveal that in this sample technicians aboard submarines had been in their billets longer than technicians aboard destroyers. This finding should not be considered generalizable. All submarines in the sample were in a routine status. None had just come from the shipyard or had just received new equipment. However, one of the three destroyers had, within the preceding two months, received an entire technician team of Oceanographic Technicians (OT) to man a new system. (Members of this team had associated with each other in school for a couple of months preceding their arrival aboard ship, but they had not worked together very long.) Also, a second destroyer was having a new system installed in the shipyard at the time of the visit, and some of its team members were new.

C. Data Gathering Procedures

Data were collected aboard each submarine, destroyer, or submarine tender, except in the case of part of one Sonar Technician (ST) team which was interviewed at a school. Technician teams and their division officer were assembled in spaces convenient to the ship; therefore accommodations varied by ship type and the individual ship's schedule.

A member of the research staff first introduced himself and briefly described the Navy Personnel Research and Development Center. The research was identified as part of a broader program which is concerned with enhancing the acceptance and utilization of new systems in the Navy. The questionnaires were then passed out, and two or three members of the research team were always present to answer any questions which might arise. Subjects completed the questionnaire within a half hour to forty minutes.

TABLE 2

Months as Team Member

Number of Months	Number of Men						Total
	Enlisted			Officer			
	Sub	Destroyer	Sub Tender	Sub	Destroyer	Sub Tender	
43-38	3	-	1	-	-	-	4
37-42	3	2	-	-	-	-	5
31-36	1	-	1	1	-	-	3
25-30	3	1	4	-	-	-	8
19-24	1	1	5	-	-	1	8
13-18	3	13	2	-	1	2	21
7-12	8	3	4	1	1	-	17
1-6	<u>4</u>	<u>9</u>	<u>8</u>	<u>1</u>	<u>1</u>	<u>-</u>	<u>23</u>
Total	26	29	25*	3	3	3	89

Note.--*Three respondents from Submarine Tenders failed to respond to this item.

III. Results

A. Rate Level of Technicians Selected for System Specialist

The instructions on the questionnaire indicated that the team members who were eligible for nomination as System Specialist were the leading petty officer (usually a chief petty officer) or any experienced second class petty officer or higher. The data in Table 3 reveal that on submarines and destroyers second class petty officers were nominated more frequently than either first class petty officers or chief petty officers. On the submarine tenders, first class petty officers were selected most frequently.

TABLE 3
Percentages of System Specialist Nominees
by Rate Level and Platform

<u>Rate Level</u>	<u>Platform</u>			<u>Total</u>
	<u>Submarines</u> (n=29 nomin- ations)	<u>Destroyers</u> (n=32 nomin- ations)	<u>Submarine Tenders</u> (n=31 nomin- ations)	
E-7, E-8, E-9	34	25	19	26
E-6	10	19	48	26
E-5	55	56	32	48

Differences between platforms regarding rate levels of nominees were statistically significant ($X^2 = 14.49$, $df = 4$, $p < .01$). This finding should be considered with reference to rate levels within the sample from each platform, as reported in Table 1. The submarine sample included one E-6 and ten E-5s; the destroyer sample included three E-6s and eleven E-5s; the submarine tender sample included eight E-6s and only five E-5s. Thus, the differences in rate level of nominees may reflect differences in rate levels physically present within each technician team. It is noted that all but two teams had an E-7, E-8, or E-9 as the leading petty officer (LPO), but the chief petty officer (CPO) was not nominated by a majority of the technicians on any platform. In viewing the individual technician teams within

each platform, however, it is revealed that the LPO was the modal choice (consensus) for the System Specialist on five of the ten teams. Three of these five teams were submarine sonar teams, and the LPO for one of these teams was an E-5.

B. Reasons Given for Selection of a System Specialist

Following his selection of a first choice and an alternate System Specialist from his team, each respondent was asked to provide three reasons for each selection. These reasons were content analyzed, and five distinct categories were determined. A sample of the types of respondent statements that were included in each of the five categories is provided in Table 4. The category labeled Competent included items pertaining to knowledge, skill and experience. The category labeled Motivation referred quite specifically to job motivation and identification with the Navy. Both the Leadership Ability and Social Skills categories referred specifically to the shipboard technical team environment. The category labeled Intelligence included items relative to speed of learning, retention of information, and direct statements of intelligence.

The frequencies of reasons given within each category are presented in Table 5, and these data indicate that a team member's competency was the most frequently cited reason for nomination as System Specialist, while factors such as leadership ability, social skills, and intelligence were rarely cited. A test for the significance of differences between platforms yielded a non-significant result ($\chi^2 = 4.7$, $df = 8$, $p > .05$).

C. Profile of First Choice Nominees for System Specialist

Those nominated as first choice for the System Specialist role were evaluated on 25 behavioral traits. The average rating and standard deviation on each trait is presented in Table 6. Overall, all nominees were rated quite high; the mean rating over all items was 11.9 on a 15-point scale. The highest mean rating (13.5) was associated with the item, "Is effective in getting the job done with little or no supervision;" while the lowest mean rating (10.5) was associated with the item, "Does not oversell ideas, procedures, or things which he likes." Viewing those items in Table 6 upon which the nominees were rated highest, it is apparent that the nominees were viewed as being very competent technicians. The data in Table 6 are pooled across platforms since analysis of variance tests revealed no response differences between platforms.

D. Description of the System Specialist Nominee in Team Sociometric Data

Each respondent was asked to list: (1) the three most knowledgeable technicians in his team, (2) the three most industrious, (3) the three who seem most calm and even-tempered in frustrating or emergency situations, (4) the three friendliest and most popular, and (5) the member or members who are the best leaders. The purpose of

TABLE 4

Sample of Respondent Statements Included in
Each of Five Content Categories

Category	Example Respondent Statement
Competency	Competent; does excellent work on his own; capable in the job; good technician; highly trained; outstanding worker; most experienced; background in electronics; experience and background in sonar; knows system.
Motivation	Eager to learn; hard worker; career oriented; energetic; interested in systems; dedication to sonar; attitude toward rate; loves his job; studies subjects he doesn't know; willing to take on new challenge.
Leadership Ability	High quality of leadership; easy to work for; responsible petty officer; gets men to do jobs and still be friends; willing to explain and teach personnel; can communicate well with junior enlisted men and senior officers; treats everyone fairly; able to maintain rational perspective for importance of equipment problems.
Social Skills	Gets along well with people; cooperative; easy to work with; good personality; tactful; good appearance.
Intelligence	Intelligent; good thinker; learns fast; retains what he is taught; bright.

the items was to assess the degree to which the System Specialist nominee would be freely included on each item.

Table 7 includes the percentages of the time that each respondent on each platform listed his nominee for System Specialist on each of the five sociometric items. It is apparent that the System Specialist was most frequently listed as one of the three most knowledgeable technicians on the team, and next most frequently listed as one of the three most industrious. The frequency with which the

TABLE 5

Number of Reasons for Selecting System Specialist
Within Each Category Over Platform

Category	Platform							
	Submarine		Destroyer		Submarine Tender		Overall	
	No.	%	No.	%	No.	%	No.	%
Competence	30	37	38	45	37	45	105	43
Motivation	22	27	17	20	21	26	60	24
Leadership Ability	14	17	10	12	11	13	35	14
Social Skills	11	14	15	18	7	9	33	13
Intelligence	4	5	4	5	6	7	14	6
TOTAL	81	100	84	100	82	100	247	100

System Specialist nominee was listed on the remaining three items varied somewhat between platforms.

E. Description of Consensus System Specialist in Team Sociometric Data

While the data in Table 7 show that on all platforms the person nominated for System Specialist was also frequently included as one of the three most knowledgeable and three most industrious, there is the possibility that a consensus System Specialist (i.e., the System Specialist nominee with the highest number of nominations from the team) might not be as highly regarded by the overall team. This possibility is especially real since the consensus System Specialist received an absolute majority of the nominations from only one-half of the teams which were sampled.

TABLE 6

Means and Standard Deviations of Item Ratings of First Choice
Nominees for System Specialist

<u>Questionnaire Item 1</u>	<u>Item Statement</u>	<u>Mean</u>	<u>S. D.</u>
d	Is effective in getting the job done with little or no supervision.	13.5	1.68
e	Is recognized as being effective by his superiors.	12.9	2.12
t	Can effectively communicate his thoughts and ideas.	12.7	2.40
r	Is able to overcome obstacles using his own resourcefulness.	12.5	2.11
m	Is an outstanding maintenance technician.	12.4	2.72
h	Maintains a high level of performance under pressure (Doesn't choke up).	12.3	2.52
o	Takes pride in his rate.	12.3	2.62
b	Gets along very well with lower ranking personnel.	12.3	2.49
i	Maintains honestly held convictions in the face of pressure.	12.3	2.58
w	Is at home enough in the system that he knows whom to see and how to approach them in order to get things done.	12.2	2.55

(Table continued on next page)

TABLE 6 (Continued)

Questionnaire Item 1	Item Statement	Mean	S. D.
a	Gets along very well with senior enlisted petty officers.	12.1	2.18
n	Is an outstanding operator.	12.1	2.45
l	Does not take advantage of others for personal gain.	12.0	3.31
s	Is realistic in estimating what can be done in a given time frame.	12.0	2.21
u	Can explain complex procedures in a clear and simple manner.	11.9	2.40
f	Is considered a team man.	11.8	2.75
k	Is receptive to the suggestions of others.	11.8	2.91
q	Keeps things in perspective and can laugh at himself.	11.8	3.03
g	Is able to maintain the big picture in his daily work (Is not a nitpicker).	11.7	2.71
j	Is flexible in testing new ways of doing things.	11.6	2.67
p	Influences others positively with his enthusiasm.	11.6	2.56

(Table continued on next page)

TABLE 6 (Continued)

<u>Questionnaire Item 1</u>	<u>Item Statement</u>	<u>Mean</u>	<u>S. D.</u>
v	Can make an unpopular decision and stick by it.	11.6	2.90
c	Gets along well with commissioned officers.	11.4	2.39
x	Does not underestimate the complexity of problems.	11.1	3.07
y	Does not oversell ideas, procedures, or things which he likes.	10.5	3.09

Note.--See Appendix A.

TABLE 7

Percentage of Respondents That Listed Their Nominee
for System Specialist on Five Sociometric Items

Sociometric Item	Platform			Total (n=92)
	Submarine (n=29)	Destroyer (n=32)	Submarine Tender (n=31)	
Knowledgeable	69%	77%	78%	74%
Industrious	66	60	59	61
Even-Tempered	59	37	56	50
Friendly	59	37	44	46
Leader	59	60	49	54

Table 8 includes the percentages of time that respondents on each platform listed the consensus System Specialist on each of the five sociometric items. It is apparent that the percentages are very similar to those obtained in Table 7, although the consensus System Specialist was included slightly less frequently on all of the sociometric items. He was, however, still considered one of the three most knowledgeable and industrious team members by most of the team.

The question is now asked whether, or to what degree, these sociometric ratings differentiate the consensus System Specialist from other team members. To answer this question, three profiles are presented in Figure 1. These profiles compare the frequency of inclusion on the sociometric items of the consensus System Specialist, a team member (E-5 or above) who was at or close to the median in the number of nominations received for System Specialist, and the team member (E-5 or above) who received the fewest nominations for System Specialist. Two major indications of the profiles are: (1) the consensus System Specialist was listed more frequently on each of the sociometric items, and (2) the largest absolute differences between the System Specialist profile and the other profiles occur with respect to the sociometric items on most knowledgeable and most industrious team members.

TABLE 8

Percentage of Respondents That Listed the Consensus
System Specialist on Five Sociometric Items

Sociometric Item	Platform			Total (n=82)
	Submarine (n=25)	Destroyer (n=29)	Submarine Tender (n=28)	
Knowledgeable	84%	76%	68%	76%
Industrious	76	52	43	56
Even-Tempered	52	36	54	48
Friendly	56	31	36	40
Leader	64	31	39	44

Note.--In comparing the differences between the data in Tables 7 and 8, the number of respondents differ. This is because the sociometric data from everyone was included in the tabulations for Table 7; however, the sociometric data from each consensus System Specialist were excluded in Table 8 data. This is because the consensus System Specialist could not list himself on the sociometric items, and the inclusion of his responses would serve to distort the team perception of the consensus System Specialist.

F. Profile of "Ideal" System Specialist Based Upon Importance Ratings of Trait Items

Technicians rated the importance of each of 25 traits on a 5-point scale. The intercorrelations of these ratings were factor analyzed (these intercorrelations are presented in Appendix B.) This factor analysis yielded 7 factors which accounted for 58 percent of the variance after being rotated to varimax criterion. A factor loading of .40 or greater was required for inclusion for interpretation. The factors, and the items included in each factor are identified in Table 9.

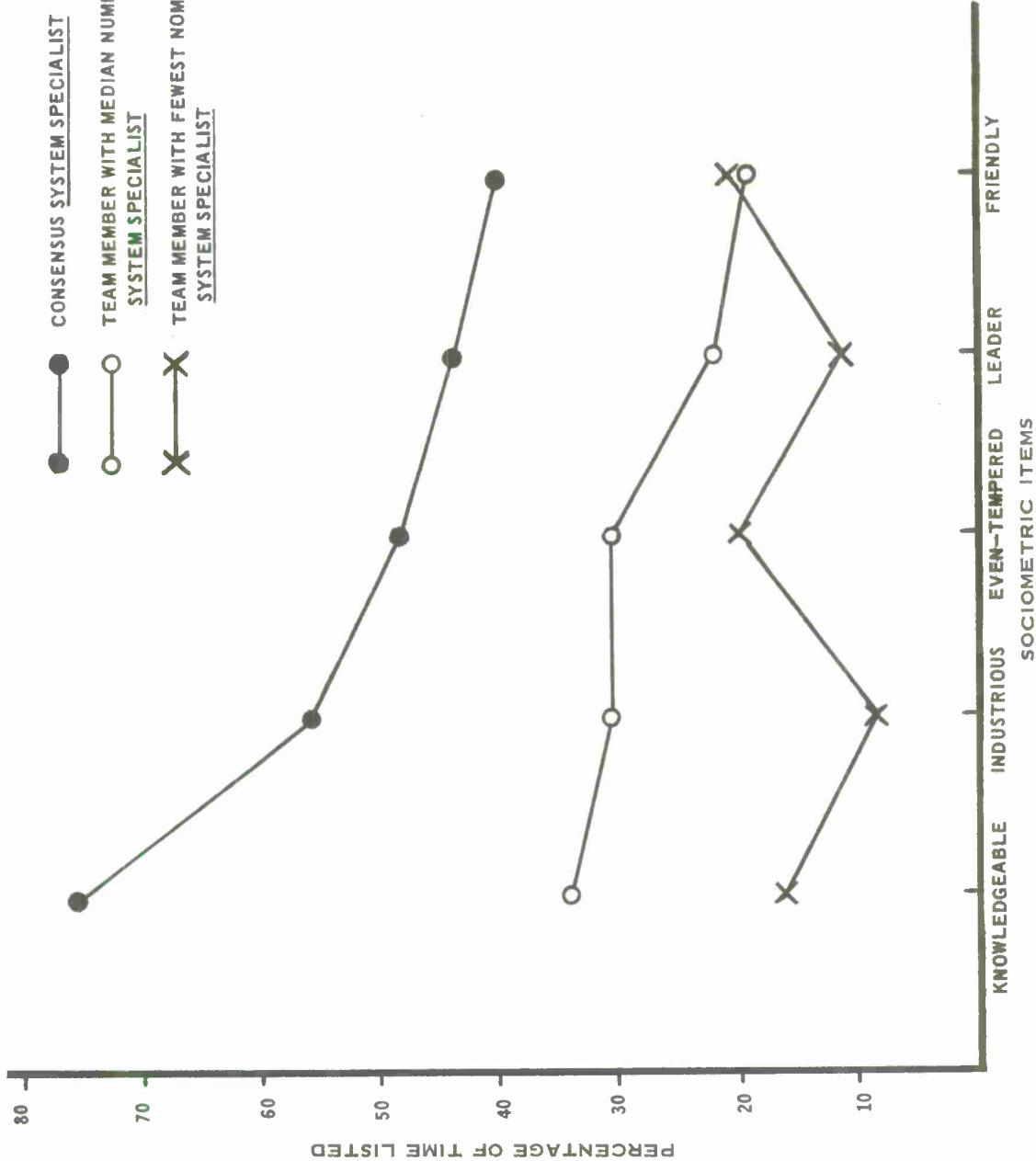


Fig. 1 Comparison of the consensus System Specialist with the members who received a median number of nominations and the fewest nominations for System Specialist with respect to five sociometric items.

TABLE 9
Factor Loadings For Seven Rotated Factors On Importance

FACTOR I		FACTOR II		FACTOR III		FACTOR IV		FACTOR V		FACTOR VI		FACTOR VII	
Effective Technician	Loadings	Objectively Oriented	Loadings	Valuable Team Member	Loadings	Interpersonally Adept	Loadings	Technically Competent	Loadings	Is considered to be a team man	Loadings	Is effective in getting the job done with little or no supervision	Loadings
Maintains a high level of performance under pressure (Doesn't choke up)	.66	Does not take advantage of others for personal gain	.68	Is considered to be a team man	.77	Gets along very well with senior enlisted petty officers	.81	Is effective in getting the job done with little or no supervision	.76	Is an outstanding maintenance technician	.44	Is able to maintain the big picture in his daily work (Is not a nit picker)	.47
Is at home enough in the system that he knows whom to see and how to approach them in order to get things done	.64	Keeps things in perspective and can laugh at himself	.68	Is an outstanding maintenance technician	.44	Gets along very well with lower ranking personnel	.62	Is able to maintain the big picture in his daily work (Is not a nit picker)	.47	Is receptive to the suggestions of others	.72	Is flexible in testing new ways of doing things	.64
Takes pride in his rate	.63	Does not oversell ideas, procedures, or things which he likes	.55	Is receptive to the suggestions of others	.72	Gets along very well with commissioned officers	.59	Is flexible in testing new ways of doing things	.64	Is flexible in testing new ways of doing things	.64	Is flexible in testing new ways of doing things	.64
Can make an unpopular decision and stick by it	.58	Can make an unpopular decision and stick by it	.47	Is flexible in testing new ways of doing things	.64	Gets along very well with commissioned officers	.59	Is flexible in testing new ways of doing things	.64	Is flexible in testing new ways of doing things	.64	Is flexible in testing new ways of doing things	.64
Gets along very well with commissioned officers	.57	Is able to maintain the big picture in his daily work (Is not a nit picker)	.44	Is flexible in testing new ways of doing things	.64	Gets along very well with commissioned officers	.59	Is flexible in testing new ways of doing things	.64	Is flexible in testing new ways of doing things	.64	Is flexible in testing new ways of doing things	.64
Maintains honestly held convictions in the face of pressure	.53	Is able to maintain the big picture in his daily work (Is not a nit picker)	.44	Is flexible in testing new ways of doing things	.64	Gets along very well with commissioned officers	.59	Is flexible in testing new ways of doing things	.64	Is flexible in testing new ways of doing things	.64	Is flexible in testing new ways of doing things	.64
Is realistic in estimating what can be done in a given time frame	.49	Is able to maintain the big picture in his daily work (Is not a nit picker)	.44	Is flexible in testing new ways of doing things	.64	Gets along very well with commissioned officers	.59	Is flexible in testing new ways of doing things	.64	Is flexible in testing new ways of doing things	.64	Is flexible in testing new ways of doing things	.64
Is recognized as being effective by his superiors	.43	Is able to maintain the big picture in his daily work (Is not a nit picker)	.44	Is flexible in testing new ways of doing things	.64	Gets along very well with commissioned officers	.59	Is flexible in testing new ways of doing things	.64	Is flexible in testing new ways of doing things	.64	Is flexible in testing new ways of doing things	.64
Is an outstanding maintenance technician	.42	Is able to maintain the big picture in his daily work (Is not a nit picker)	.44	Is flexible in testing new ways of doing things	.64	Gets along very well with commissioned officers	.59	Is flexible in testing new ways of doing things	.64	Is flexible in testing new ways of doing things	.64	Is flexible in testing new ways of doing things	.64
Influences others positively with his enthusiasm	.41	Is able to maintain the big picture in his daily work (Is not a nit picker)	.44	Is flexible in testing new ways of doing things	.64	Gets along very well with commissioned officers	.59	Is flexible in testing new ways of doing things	.64	Is flexible in testing new ways of doing things	.64	Is flexible in testing new ways of doing things	.64
Is able to overcome obstacles using his own resourcefulness	.41	Is able to maintain the big picture in his daily work (Is not a nit picker)	.44	Is flexible in testing new ways of doing things	.64	Gets along very well with commissioned officers	.59	Is flexible in testing new ways of doing things	.64	Is flexible in testing new ways of doing things	.64	Is flexible in testing new ways of doing things	.64
		Can explain procedures in a clear and simple manner	.66	Is flexible in testing new ways of doing things	.64	Gets along very well with commissioned officers	.59	Is flexible in testing new ways of doing things	.64	Is flexible in testing new ways of doing things	.64	Is flexible in testing new ways of doing things	.64
		Does not underestimate the complexity of problems	.54	Is flexible in testing new ways of doing things	.64	Gets along very well with commissioned officers	.59	Is flexible in testing new ways of doing things	.64	Is flexible in testing new ways of doing things	.64	Is flexible in testing new ways of doing things	.64
		Is an understanding operator	.50	Is flexible in testing new ways of doing things	.64	Gets along very well with commissioned officers	.59	Is flexible in testing new ways of doing things	.64	Is flexible in testing new ways of doing things	.64	Is flexible in testing new ways of doing things	.64

Factor I accounts for 28 percent of the total variance and describes a person who is an Effective Technician. Six of the 11 items comprising this factor, including the two with the highest factor loadings, appear to relate to the effectiveness of the individual operating within the technological Navy system. Example items are "Maintains a high level of performance under pressure," "Is at home enough in the system that he knows whom to see and how to approach them in order to get things done," and "Is recognized as being effective by his superiors." The remaining five items round out important aspects which enhance the credibility of an effective technician in the Navy team. Example items are: "Takes pride in his rate," "Maintains honestly held convictions in the face of pressure," and "Influences others positively with his enthusiasm."

Factor II is composed of five items and accounts for seven percent of the total variance. The items included in this factor describe a technician who is Objectively Oriented. The items describe someone who focuses on the job to be done, maintains an objective perspective, and does not get distracted by personal ambition or desires.

Factor III accounted for six percent of the total variance. Three items comprising this factor describe a technician who is Interpersonally Adept; this technician gets along very well with his superiors, his peers, and his subordinates.

Factor IV contains four items, three of which describe a Skillful Communicator. The fourth item, "Is an outstanding operator," possibly was loaded on this factor because the operator must in fact communicate his observations. This factor accounted for six percent of the total variance.

Factor V is composed of only two items, and it accounts for five percent of the total variance. The two items describe a technician who is a valuable Team Member. He is both a team man and an outstanding technician.

Factor VI is also composed of two items, and these items describe a technician who is Flexible. This factor accounted for only three percent of the total variance.

Finally, two items make up Factor VII, which also accounted for three percent of the total variance. These items describe a technician who is Technically Competent. In contrast to each of the other factors, no item in this factor has any team or interpersonal reference.

Table 10 presents the 25 traits in rank order according to importance for the "Ideal" System Specialist. This Table also presents the mean, standard deviation, associated factor and factor loading for each trait. An analysis of the data in Table 10 yields three interesting findings. First, Factors I, IV, V, VI, and VII might be considered more important factors than Factors II and III. From 50 percent to

TABLE 10

Means and Standard Deviations of Item Ratings and Factor Relationships Between Items Based Upon Ratings of Importance of Each Item for System Specialist Role

Questionnaire Item*	Item Statement	Mean	S.D.	Factor No.**	Factor Loading
d	Is effective in getting the job done with little or no supervision.	4.8	.53	VII	.76
t	Can effectively communicate his thoughts and ideas.	4.6	.76	IV	.81
m	Is an outstanding maintenance technician.	4.6	.75	I V	.42 .44
u	Can explain complex procedures in a clear and simple manner.	4.5	.97	IV	.65
w	Is at home enough in the system that he knows whom to see and how to approach them in order to get things done.	4.5	.85	I	.64
j	Is flexible in testing new ways of doing things.	4.4	.80	VI	.64
r	Is able to overcome obstacles using his own resourcefulness.	4.4	.80	I	.41
h	Maintains a high level of performance under pressure (Doesn't choke up).	4.4	.82	I	.66

(Table continued on next page)

TABLE 10 (Continued)

Questionnaire Item*	Item Statement	Mean	S.D.	Factor No.**	Factor Loading
k	Is receptive to the suggestions of others.	4.3	.81	VI	.72
n	Is an outstanding operator.	4.3	.98	IV	.50
s	Is realistic in estimating what can be done in a given time frame.	4.3	.97	I	.49
e	Is recognized as being effective by his superiors.	4.2	.95	I	.43
i	Maintains honestly held convictions in the face of pressure.	4.2	.97	I	.53
b	Gets along very well with lower ranking personnel.	4.1	1.04	III	.62
o	Takes pride in his rate.	4.1	1.16	I	.63
p	Influences others positively with his enthusiasm.	4.1	.92	I	.41
x	Does not underestimate the complexity of problems.	4.1	1.02	IV	.54
f	Is considered a team man.	4.0	1.11	V	.77

(Table continued on next page)

TABLE 10 (Continued)

Questionnaire Item*	Item Statement	Mean	S.D.	Factor No.**	Factor Loading
g	Is able to maintain the big picture in his daily work (Is not a nitpicker).	3.9	1.13	II VII	.44 .47
v	Can make an unpopular decision and stick by it.	3.8	1.24	I II	.58 .47
a	Gets along very well with senior enlisted petty officers.	3.8	1.21	II	.81
q	Keeps things in perspective and can laugh at himself.	3.7	1.23	II	.68
l	Does not take advantage of others for personal gain.	3.6	1.44	II	.68
y	Does not oversell ideas, procedures, or things which he likes.	3.6	1.23	II	.55
c	Gets along very well with commissioned officers.	3.5	1.19	I III	.57 .59

Note.--

*See Appendix A.

**Refers to Factor number in Table 9.

100 percent of the items included in each of Factors I, IV, V, VI, and VII were above the mean value of item importance; none of the items included in Factors II and III were above the mean.

The second finding is that the item which was ranked most important, "Is effective in getting the job done with little or no supervision," was included in Factor VII, which accounted for the least amount of variance. The importance of that item is however, underscored by the fact that the ratings of this item were significantly higher than those for 17 of the other items ($p < .05$ by Newman-Keuls procedures).

The third finding is that 39 percent of the item ratings are significantly different from each other ($p < .05$). An analysis of variance was performed between items. The results were subjected to a Newman-Keuls Multiple Range Test. One hundred and eighteen of 300 comparisons were significantly different ($p < .05$ by Newman-Keuls procedures).

G. Comparison Between Ratings of First Choice Nominees for System Specialist and Importance of Items for System Specialist

On each of the 25 trait items a comparison was made between the ratings given to first choice nominees for System Specialist and the rating given for the importance of the item. This was done to assess whether or not respondents differentiated between the two types of ratings, and if they did, to what degree the first choice for System Specialist possessed the traits which were rated as being important for the System Specialist.

Regarding the first concern, a product moment correlation of .64 was obtained between the means of ratings given the first choice for System Specialist and the means of importance ratings on the 25 items. The magnitude of this correlation indicates that there was differentiation in the responses to the two rating tasks, and that the traits ascribed to first choices for System Specialist were substantially related to those traits which were considered important.

H. Acceptance of the System Specialist Role

The final results relate to the acceptance of the System Specialist role. Four questions were asked, and responses are generally positive. Mean ratings of 13.1 on a 15-point scale were obtained, with 15 being strong agreement, to the following two items: (1) "It (the System Specialist) is a good idea" (2) "The System Specialist would perform an important function." The mean values were homogeneous across platforms, ranging from 12.6 to 13.5, with standard deviations between 1.8 and 3.8. Additionally, 79 percent of the respondents indicated that they anticipated that their first choice for System Specialist would like the role, and 54 percent of the respondents indicated that they would like the role themselves. The lower percentage of respondents indicating that they would like the role themselves should be interpreted with respect to rate level. The data in Table 11 indicate

that a large majority of the personnel at all rate levels were confident that their nominee for System Specialist would like the role, but that only at the chief petty officer and first class petty officer level did a large majority of the personnel feel that they personally would like the role. Another interesting finding is that almost one-half of the division officers indicated that they would like the System Specialist role. In general, limited duty officers indicated a preference for the role; general line officers did not.

TABLE 11

Desirability of System Specialist Role

<u>Rate Level</u>	<u>First Choice for <u>System Specialist</u> Would Like Role</u>	<u>Respondent Would Like The Role</u>
Division Officers (n=9)	89%	44%
E-7, E-8, E-9 (n=10)	80	70
E-6 (n=12)	75	75
E-5 (n=26)	73	58
E-3, E-4 (n=35)	80	23

A final and important question is whether the consensus System Specialist from each platform indicated that he personally would like the System Specialist role. The consensus System Specialist was not present when data were gathered on two of the ten technician teams; thus, there is no information on them. Seven of the remaining eight consensus System Specialists, or 87 percent, indicated that they would like the role.

IV. Discussion

A. Generality of Findings

It is recalled that the basic purpose of this research is to assess the need for and desirable traits of a Change Advocate, who will function within a Navy technician team. His role will be to represent the user (a Navy technician team) as he leads them in trying out a new equipment or system. This research is, in fact, part of a broader program in which the Change Advocate concept will be experimentally evaluated in the operational Navy context.

The question of generalization beyond the immediate sample is thus important for two reasons: (1) training of the experimental Change Advocates will be, in part, determined by the findings of this study and (2) the broader research program is viewed as a tryout of a model that may have Navy-wide application.

In order to assess the degree to which the results might be generalized, technician teams were interviewed aboard submarines, submarine tenders, and destroyers. In addition to platform differences within this sample, there was variation in both technician ratings and types of equipments and systems which the technicians were asked to consider for adoption. The latter two variables were imbedded within the platforms and should serve to increase platform differences. The amount of agreement observed in the results indicates considerable generality. Regardless of platform the findings consistently indicate that: (1) Change Advocates (called System Specialists) were nominated for the same reasons, (2) similar traits were considered important for the role, (3) Change Advocate nominees were evaluated similarly on sociometric items, (4) the Change Advocate role was considered important, and (5) most technicians, who were qualified in terms of rate level for the role, desired the role.

B. The Change Advocate (System Specialist)

1. Representative of User Group versus Representative of Change Agent. In considering the change process as it occurs when a new system is introduced to a Navy technician team, two factors should be recognized. First, the change is imposed; the team does not have a say in whether or not the new system is needed or wanted. Second, the team will have to operate and maintain the system with little or no outside support. Recognizing this, it was considered desirable to establish a Change Advocate within each team. A review of the literature reveals that this may be a relatively unique application of the Change Advocate concept, since most research has focused upon the role of a Change Agent or Change Advocate who is external to the user group (Bowers, 1973; Havelock, 1973; Jones, 1969). This research has been carried out in educational or industrial settings. Jones (1969), however, points out that the functions of introducing and facilitating a given change can be performed by someone within the user group, and Mecherikoff and Mackie (1970), who were concerned with the military

environment, suggested that ideally the Change Advocate should be selected from the user group but represent the Change Agent. The research staff considered this possibility but felt that: (1) the visiting Change Advocate would be viewed at best as an ex-member of the user population but not as a member of the particular user group, and (2) there would be an advantage of having a trained Change Advocate aboard at all times as part of the technician team. Thus, in the present study, the identification of the Change Advocate as a member and representative of the technician team is relatively unique; however, it is considered a logical adaptation for the specific environment. The high endorsement of this concept by experienced fleet technicians is viewed as a validation.

2. Role and Characteristics of the Change Advocate. In designing the present study and instruments the Change Advocate role was conceived of with respect to the six step adoption process in a model presented by Havelock (1973) and a discussion and review of literature by Mecherikoff and Mackie (1970). In Havelock's model, the Change Advocate interacts with the user to facilitate each of the following phases of change in order: (1) awareness of the change, (2) interest, or seeking information about the change, (3) evaluation in the sense of a positive expectation of the effect of the change, (4) trial, or an actual test of the change, (5) adoption of the change, and (6) integration of the change into daily routine. In order to facilitate these processes it is obvious that the Change Advocate must have a thorough knowledge of the change and be skilled in dealing with the user group.

In considering the specific characteristics of the Change Advocate, Mecherikoff and Mackie (1970) provide a specific list of five desirable traits. They indicate that the Change Advocate should be (1) credible, (2) a member of the user population whenever possible, (3) influential with the user population, (4) perceived as an expert by the user population, and (5) physically attractive.

Recent work by Bowers (1973) emphasizes the requirement for task competency. Bowers studied the performance of Change Agents in industrial settings and reports the characteristics of successful and unsuccessful Change Agents. The successful Change Agents, "pushed the change process toward a more task-oriented, problem solving format, involving increased cognitive understanding of issues, concepts, and possibilities, and away from emotional affect-laden interpersonal confrontations [p. 5]." Conversely, less successful Change Agents were less task-oriented.

It is interesting to review the responses of subjects in the present study in light of the preceding discussion. The respondents in the present study were provided only a rather sketchy description of the Change Advocate role. (See Appendix A). The absence of detail was intentional since it was anticipated that great detail would lead subjects to respond to the questionnaire in terms of the specifics of the description. As it is, responses to the questionnaire items and respondents' reasons for selecting people to fill the role are interpreted

to reflect what the technicians desired in the role. Interestingly, technicians emphasized task-oriented traits like competency, effectiveness, and knowledge as being most important for the Change Advocate. While leadership and interpersonal skills within the team were important, it is clear that the Change Advocate (System Specialist) must first and foremost be technically competent with regard to the new equipment or system.

The strong emphasis upon technical credibility (e.g., knowledgeable, competent, effective) leads to the anticipation that the Change Advocate, who meets the criteria established in this study, will be an effective communicator. Research on change and influence has dealt intensively with the characteristics of the source or communicator. A current view of source variables, which posits three major components, has been articulated in its fullest detail by Kelman (1961). Kelman hypothesized that three types of characteristics are salient: credibility, attractiveness, and power. Further, these three lead to attitude change by means of three different psychological modes, which Kelman labels respectively internalization, identification, and compliance. Internalization, as a mode of change is, according to McGuire (1968), "based on the person's motivation to have some objectively verified 'right' stand on the issue [p. 179]." In contrast, identification involves the receiver's wish to establish a satisfying role relationship to the source, and compliance involves mere public acquiescence. In the Change Advocate context, internalization would appear to be the more preferred mode of change, since it is essential that the receiver's task-oriented attitude toward the system endure independent of the Change Advocate.

The research of Bowers (1973) points out another characteristic of the Change Agent which bears upon the present study. The influence of a leader may be based upon legitimacy or incremental influence. In the former case the power lies in one being designated a leader by organizational title or position. In the latter case, the leader builds his influence through his capacity and expertise. Successful Change Agents relied more upon incremental influence.

Three types of findings in the present study are interpreted to indicate that respondents preferred a Change Advocate who had incremental influence. First, the reasons given for nominating a team member to be Change Advocate stressed the nominee's competency rather than his organizational role. Second, the sociometric data emphasized knowledge and industriousness far more than leadership. Finally, the fact that most technicians nominated someone other than their leading petty officer is perhaps the clearest indication of the emphasis upon incremental influence over legitimacy.

3. Organizational Constraints on Shipboard Change Advocates. In concluding this discussion of the Change Advocate role, it is important to recognize one major difference between the Change Agent described by Bowers (1973), Havelock (1973), Jones (1969), and the Change Advocate role in this study. The Change Agents described by the above researchers

are operating in an organizational environment in which processes or procedures within the organization are typically the changes of interest. As proposed in this study, broader climatic organizational variables are essentially fixed; i.e., the Change Advocate will accept Navy and shipboard traditions, doctrine, organization, procedures, etc. as they are in virtually all cases. In specific instances in which a shipboard procedure might conflict with some aspect of the operation or maintenance of the new equipment or system, the Change Advocate will make this conflict known to legitimate authorities within the system and if appropriate, suggest changes.

The Change Advocate will exert a strong influence upon the climate within his technician team; it is hoped that he will, for example, foster a task orientation toward the new system, and that he will also encourage questions and ideas about the new system. However, it is essential to recognize that changes in most organization variables will be beyond the scope of the shipboard Change Advocate.

C. Importance of the Change Advocate Role in the Shipboard Setting

The results strongly indicate that the role was considered important by a large majority of the respondents. Two direct indications of perceived importance of the role were obtained from the following items: (1) "It (the System Specialist role) is a good idea," and (2) "the System Specialist would perform an important function." Endorsement of both statements showed a mean rating of 13.1 on a 15-point scale. These direct indications were supported by the findings that the consensus System Specialist, (i.e., the man who would actually be identified as a Change Advocate for the team), was highly regarded by the team on sociometric measures and that senior enlisted personnel (E-6, E-7, E-8, E-9) considered the role attractive.

D. Implications for the Broader Research Program

It has been stated earlier in this report that this study is part of a broader effort. The anticipated values of this initial study are that it should provide information relative both to the fleet acceptance of the Change Advocate role and to the structure of the role.

Since the role appears to be enthusiastically accepted, the authors are not confronted with an unpleasant decision of whether to continue the research. The data describing both the first choice Change Advocate and the "Ideal" Change Advocate will now be used in structuring a training program for Change Advocate. In adhering to the implications of this study, the training will stress a task orientation and the need to establish and preserve credibility via competency with the new system.

There were a couple of questionnaire items upon which the first choice Change Advocate was possibly considered relatively low while the item was considered relatively important for the "Ideal" Change

Advocate. A comparison of the data in Tables 6 and 10 reveals that the mean value for the item, "Is flexible in testing new ways of doing things," ranked sixth in importance for the "Ideal" Change Advocate, but its mean ranked 20th as a characteristic of Change Advocate nominees. Also the mean value for the item, "Can explain complex procedures in a clear and simple manner," ranked fourth in importance for the "Ideal" Change Advocate, while the mean on this item ranked 15th among the characteristics of nominees for Change Advocate. It would appear appropriate that Change Advocate training should emphasize the need for flexibility and skill in explaining complex procedures.

One caution in accepting the preceding interpretation stems from the observation that all ratings were toward the high end of the scales. The possibility of a strong response bias must thus be considered. Depending upon whether or not a response bias was present, an item mean with a rank order of 20 from the 25 item set, may indicate that the ratee is weak on this trait in an absolute sense. Unfortunately, in constructing the questionnaire, only items with high face validity were included; thus, the importance of all items may be real. Additionally, only technicians who were selected as first choice for Change Advocate were rated; thus, only better technicians were rated. Although it is difficult to assess the degree to which the high ratings are evidence of a response bias, there are three indirect bits of evidence that support the validity of the ratings. First, the sociometric data clearly indicated that first choice Change Advocate nominees ranked higher than others in their team on the five items in that analysis. Second, the finding that most of the lower rated items were clustered in two of seven factors suggests some discrimination in response as a function of item content. Third, the results of a Newman-Keuls test revealed that respondents differentiated between items in their importance ratings.

V. Conclusions

Four purposes of this study were listed in the introduction. These were to identify: (1) whether fleet technical personnel could accept the Change Advocate concept within their team, (2) what characteristics are deemed important for a Change Advocate in the shipboard setting, (3) whether some technical personnel presently aboard ships possess the characteristics deemed essential for the Change Advocate, and (4) whether responses from technical personnel would be platform specific (i.e., submarine, destroyer, submarine tender) and thus negate the possibility of a generalizable Change Advocate concept within the Navy. The conclusions are stated relative to these purposes, and it is concluded that:

A. Fleet technical personnel will accept someone within their team who performs a Change Advocate role.

B. The team Change Advocate must establish his influence on the basis of competency. He must prove himself effective in getting the technical job done; be technically competent, and communicate effectively with his team.

C. By and large, technician teams have at least one member who is perceived by his peers as being qualified for the role. Nominees were rated high on most traits which were considered essential for the "Ideal" Change Advocate.

D. Responses by technicians were not platform specific. The data would support the feasibility of a Change Advocate model for Navy technical teams regardless of platform.

REFERENCES

1. Bowers, D. Studies in effective change agency. Presentation to APA Symposium, August, 1973.
2. Elizur, Dov. Adapting to Innovation. Jerusalem Academic Press, 1970.
3. Havelock, R. The change agents' guide to innovation in education. Englewood Cliffs, New Jersey: Educational Technology Publication, January 1973.
4. Jones, G. Planned organizational change. New York: Frederick A. Praeger, 1969.
5. Kelman, H. Process of opinion change. Public Opinion Quarterly, 1961, 25, 57-78.
6. McGuire, W. The nature of attitudes and attitude change. The Handbook of Social Psychology, Vol. III, 2nd edition, Lindzey & Aronson, (Ed.), 1968, 136-314.
7. Mackie, R. R., Kelley, G. R., Moe, G. L., & Mercherikoff, M. Factors leading to the acceptance or rejection of training devices, Goleta, California: Human Factors Research, Inc., NAVTRAQUIPCEN, 70-c-0276-1, August 1972.
8. Mathews, J. B., Whittenburg, J. A., Barnes, B. P., Cheek, F. V., & Wise, J. E. A pilot study to investigate nonutilization of Navy equipment (U). McLean, Va.: Human Sciences Research, Inc., HSR-RR 65/9-Rn, December 1965. CONFIDENTIAL.
9. Mecherikoff, M., & Mackie, R. R. Attitudinal factors in the acceptance of innovations in the Navy. Goleta, California: Human Factors Research, Inc., Technical Report 784-1, Contract No. N00014-68-C-0304, June 1970.
10. Seymour, G. The concurrent validity of unobtrusive measures on conflict in small isolated groups. Journal of Clinical Psychology, 1971, 27, 4, 431-435.
11. Stern, H. A survey of procedures used in the operation of the AN/SQS-26 sonar system. San Diego, California: Naval Personnel and Training Research Laboratory, Research Report SRR 71-21, March 1971.

APPENDIX A

Questionnaire Used In Study

The questionnaire used for the surface Sonar Technicians (ST) in this study is included as Appendix A. For other technician teams, the questionnaire was reworded to reflect their ratings and to specify an equipment appropriate to their area.

APPENDIX A

Questionnaire Used In Study

Name _____

Rank _____

For many years the Navy has had problems when major new equipments and systems have been introduced to the Fleet. The reasons for these problems are many. The Navy Personnel Research and Development Center is conducting research to learn how many of these problems can be avoided in the future. One idea which will be tried out in the near future is to have a System Specialist aboard each ship which receives the new system. He will be selected from each crew receiving the new system. His task will be to facilitate the introduction of the new equipment by being aware of and dealing with problems which frequently arise when new systems are introduced. He will receive and/or monitor all documentation regarding the new equipment that will be of value to the ship. He will try to represent the requirements of the crew to those involved in equipment development, and he will try to acquaint the crew with the new equipment in an honest and constructive manner.

The System Specialist can be the LPO or any experienced ST-2 or higher. In addition to possessing the typical job skills and knowledge, he should have the ability to do the following types of things:

- a. Keep up to date in his knowledge of the new equipment.
- b. Show enthusiasm about his role as System Specialist-- encourage others to learn about the system.
- c. Communicate with people in supporting activities with whom he will discuss technical problems.
- d. Work with the team and with officers aboard the ship in working out periodic problems that occur with almost every new equipment.
- e. Receive, keep track of, and encourage the use of various shipboard training materials which will be sent to the ship.

ALL RESPONSES TO THIS QUESTIONNAIRE ARE CONFIDENTIAL. NO ONE OTHER THAN THE RESEARCH STAFF WILL HAVE ACCESS TO THIS MATERIAL.

APPENDIX A (Continued)

Your ship has the AN/SQS-35, which is a relatively new sonar system. This sonar system will involve many changes in operation and/or maintenance procedures. As is the case with all new equipments, many problems will have to be ironed out. For example, it can be anticipated that you will not immediately have all of the information that you will need for optimal operation and maintenance of the equipment. Also, with the new systems there are logistic problems at times.

Please answer the following questions honestly. Your answers will be held in the strictest confidence. No one other than the research team will see, or be told of your answers. We are asking these questions because we are trying to determine the type of person who should be a System Specialist

1. Whom would you select from your team to be the System Specialist, and whom would you select as an alternate? (Exclude yourself.)
 - a. _____ (first choice)
 - b. _____ (alternate)
2. List three reasons why you selected each person. Your reasons may or may not be the same for each person.

Reasons for selecting first choice:

Reasons for selecting alternate:

APPENDIX A (Continued)

3. Regarding the person whom you selected as System Specialist (first choice only) please rate him on each of the following scales. Do this by marking an X at the point of the scale which you feel the person belongs. Also in the right hand column rate the importance of the trait for the System Specialist, using a scale of 1 to 5. A rating of 1 means that the trait is not related to the job, as you now conceive of the System Specialist.

Importance of Trait
for System Specialist
1 - Not Related
5 - Definitely Related

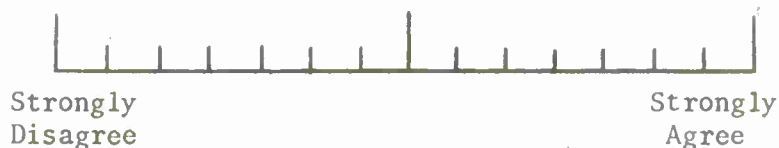
- a. Gets along very well with senior enlisted petty officers. _____



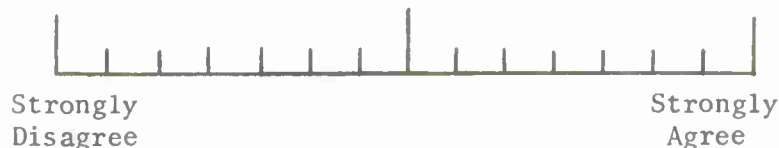
- b. Gets along very well with lower ranking personnel. _____



- c. Gets along very well with commissioned officers. _____



- d. Is effective in getting the job done with little or no supervision. _____



APPENDIX A (Continued)

Importance of Trait
for System Specialist
1 - Not Related
5 - Definitely Related

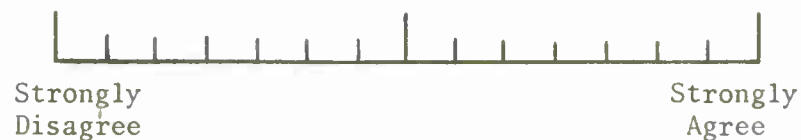
- e. Is recognized as being effective by his _____
superiors.



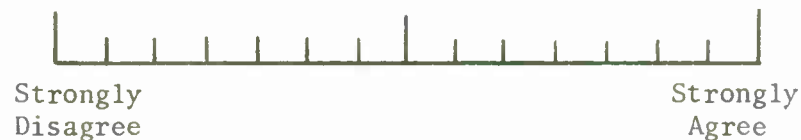
- f. Is considered to be a team man. _____



- g. Is able to maintain the big picture in his _____
daily work (Is not a nitpicker).



- h. Maintains a high level of performance under _____
pressure (Doesn't choke up).



- i. Maintains honestly held convictions in the face _____
of pressure.



APPENDIX A (Continued)

Importance of Trait
for System Specialist
1 - Not Related
5 - Definitely Related

- j. Is flexible in testing new ways of doing things. _____

Strongly Disagree Strongly Agree

- k. Is receptive to the suggestions of others. _____

Strongly Disagree Strongly Agree

- l. Does not take advantage of others for personal gain. _____

Strongly Disagree Strongly Agree

- m. Is an outstanding maintenance technician. _____

Strongly Disagree Strongly Agree

- n. Is an outstanding operator. _____

Strongly Disagree Strongly Agree

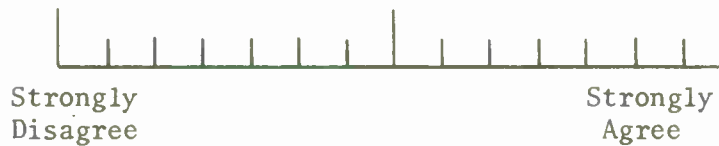
APPENDIX A (Continued)

Importance of Trait
for System Specialist
1 - Not Related
5 - Definitely Related

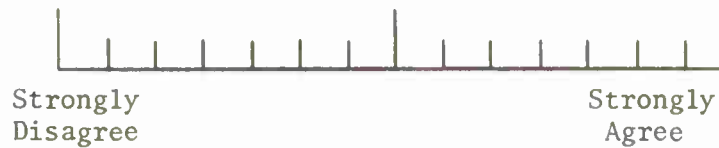
- o. Takes pride in his rate. _____



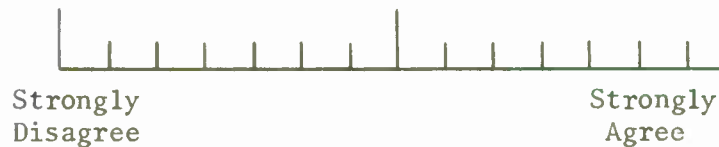
- p. Influences others positively with his enthusiasm. _____



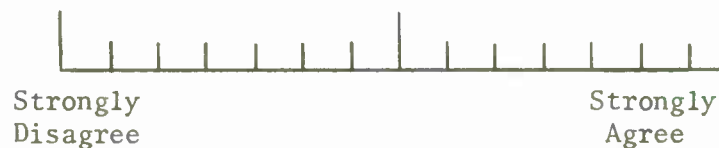
- q. Keeps things in perspective and can laugh at himself. _____



- r. Is able to overcome obstacles using his own resourcefulness. _____



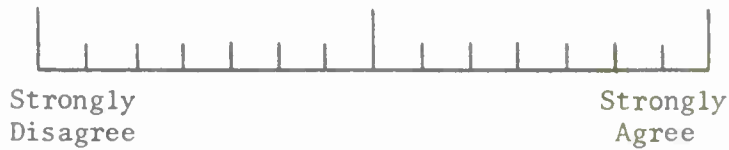
- s. Is realistic in estimating what can be done in a given time frame. _____



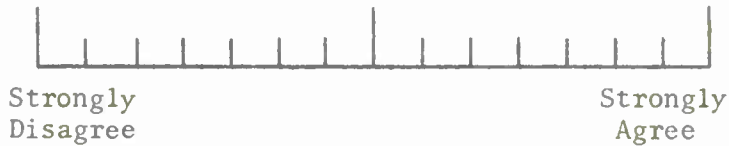
APPENDIX A (Continued)

Importance of Trait
for System Specialist
1 - Not Related
5 - Definitely Related

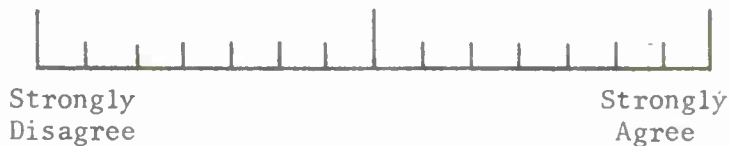
- t. Can effectively communicate his thoughts and ideas to others. _____



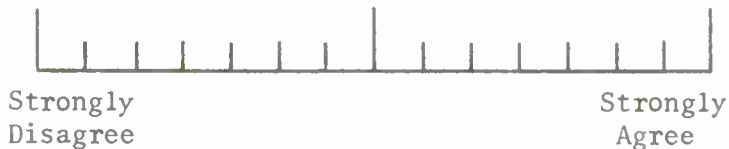
- u. Can explain complex procedures in a clear and simple manner. _____



- v. Can make an unpopular decision and stick by it. _____



- w. Is at home enough in the system that he knows whom to see and how to approach them in order to get things done. _____



- x. Does not underestimate the complexity of problems. _____



APPENDIX A (Continued)

Importance of Trait for System Specialist

1 - Not Related

5 - Definitely Related

- y. Does not oversell ideas, procedures, or things which he likes. _____

4. Please indicate now how you would feel about having a System Specialist aboard your ship for some new equipment which is to be installed.

- a. It is a good idea.

- b. The System Specialist would perform an important function.

Strongly Disagree Strongly Agree

5. Do you think that the person whom you listed as first choice would like to be a System Specialist?

Yes _____ No _____

6. Would you like to be a System Specialist?

Yes _____ No _____

7. How long have you been a member of the ST team on this ship?
months.

APPENDIX A (Continued)

8. Name three men in the ST team who impress you most by their knowledge of their jobs.

(1) _____
(2) _____
(3) _____

9. Name three men in the ST team who seem to be most industrious and hardest working in carrying out their jobs.

(1) _____
(2) _____
(3) _____

10. Name three men in the ST team who seem to be most calm and even-tempered even in frustrating or emergency situations.

(1) _____
(2) _____
(3) _____

11. Name three men who seem to be the friendliest and most popular in the ST team.

(1) _____
(2) _____
(3) _____

12. Are there any persons in the ST team whom you feel you really don't know. If so, who?

13. Which person, or persons, impress you most by their ability to provide leadership for others when it is needed?

APPENDIX B

Intercorrelation Matrix of Items Included in Factor Analysis

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
1.	1.0																								
2.	.52	1.0																							
3.	.65	.36	1.0																						
4.	.17	.18	.24	1.0																					
5.	.31	.02	.37	.21	1.0																				
6.	.08	.30	.05	.20	.20	1.0																			
7.	.06	.06	.24	.35	.24	.44	1.0																		
8.	.31	.57	.40	.14	.33	.14	.16	1.0																	
9.	.22	.18	.42	.18	.34	.13	.28	.41	1.0																
10.	-.03	.07	.19	.39	.08	.24	.33	.13	.25	1.0															
11.	.14	.25	.35	.36	.10	.44	.38	.25	.37	.59	1.0														
12.	.25	.13	.23	.06	.24	.22	.40	.12	.29	.25	.30	1.0													
13.	.05	.06	.28	.29	.13	.36	.19	.40	.22	.16	.28	.05	1.0												
14.	.00	.06	.13	.05	.16	.32	.13	.36	.13	.18	.24	-.04	.25	1.0											
15.	.22	.09	.43	.00	.30	.26	.09	.41	.46	.31	.39	.25	.43	.25	1.0										
16.	.33	.31	.46	.14	.36	.33	.31	.33	.36	.31	.35	.34	.29	.24	.46	1.0									
17.	.33	.25	.32	-.03	.29	.35	.39	.26	.43	.29	.38	.46	.02	-.01	.31	.43	1.0								
18.	.10	.10	.24	.31	.26	.28	.41	.38	.39	.29	.21	.13	.33	.34	.23	.27	.21	1.0							
19.	.10	.03	.27	.19	.14	.13	.31	.42	.39	.38	.41	.33	.15	.31	.38	.27	.43	.37	1.0						
20.	.40	.32	.14	.02	.11	.23	.10	.21	.21	.16	.05	.30	.04	.34	.11	.34	.28	.22	.28	1.0					
21.	.42	.32	.26	.22	.25	.37	.26	.31	.18	.17	.17	.31	.21	.35	.17	.44	.28	.27	.25	.77	1.0				
22.	.31	-.02	.38	.01	.23	.08	.30	.39	.45	.18	.21	.34	.13	.12	.33	.36	.53	.28	.53	.18	.23	1.0			
23.	.31	.06	.42	.16	.29	.03	.22	.43	.41	.29	.24	.19	.19	.33	.47	.42	.30	.36	.52	.32	.27	.51	1.0		
24.	.20	.26	.15	.07	.21	.30	.25	.29	.24	.31	.27	.43	.12	.36	.38	.28	.32	.32	.45	.50	.37	.25	.49	1.0	
25.	.22	.19	.09	-.01	.07	.23	.20	.18	.25	.26	.16	.56	-.03	.14	.14	.23	.41	.33	.30	.36	.39	.33	.20	.47	1.0

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